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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,636	09/16/2003	Syamal K. Ghosh	86895RLO	1919

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EXAMINER

WOLLSCHLAGER, JEFFREY MICHAEL

ART UNIT

PAPER NUMBER

1732

DATE MAILED: 06/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/663,636	Applicant(s) GHOSH ET AL.	
	Examiner Jeff Wollschlager	Art Unit 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's amendment filed April 17, 2006 has been accepted. Claim 6 has been amended and claim 9 has been cancelled. Claims 1-8 and 10 are pending. The 35 U.S.C. 112 rejections of claims 6 and 9 have been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1- 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi (European Patent Application 1 156 536; published November 21, 2001) in

view of Van Slyke et al. (European Patent Application 1 274 136; published January 8, 2003).

Regarding claim 1, Shi teaches a method for forming a homogeneous mixture of powders of organic material including at least one dopant component and one host component to provide a homogeneous mixture for forming a pellet for thermal physical vapor deposition producing an organic layer on a substrate for use in an organic light-emitting device comprising a) combining organic materials, such materials including at least one dopant component and one host component, b) placing the mixture of organic materials in a container, d) heating the organic materials in the container until the organic materials are melted, e) mixing the organic materials to form a homogeneous mixture of organic materials, f) solidifying the homogeneous mixture of organic materials and g) removing the solidified homogeneous mixture of organic materials from the container (paragraphs [0032, 0067-0068]). Shi does not explicitly teach c) sealing the container in a reduced pressure environment.

However, Van Slyke et al. teach that organic powders used in thermal physical vapor deposition have a high propensity to entrain air and/or moisture between particles under ambient conditions and that it is required to outgas a charge of organic powders placed into a vapor deposition chamber through preheating the powder at a reduced pressure (paragraph [0009]).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to modify the method taught by Shi with the additional teaching of Van Slyke et al. to seal the container in a reduced pressure

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environment because one having ordinary skill would be motivated to eliminate the problems associated with incomplete outgassing and would further recognize that heating the container having the powder at a reduced pressure would be even more beneficial since the required outgassing would clearly become more difficult once the powders are compacted into pellet form as taught by Van Slyke et al. Additionally, one of ordinary skill would be motivated to reduce the pressure in the mixing container to minimize the risk and exposure to flammable and toxic vapors and to expedite the melting process.

As to claim 2, Shi takes the solid compacted mixture and places a homogenous mixture of powders into a single evaporation source. Implicitly this requires pulverizing/breaking up of the solid in order to get the solid mixture out of the container and to place only a portion of the solid homogeneous powder mixture into the evaporation source (paragraphs [0031-0032]; Figure 3). Shi does not teach compacting the homogenous mixture to form a pellet. However, Van Slyke et al. teach compacting the homogeneous mixture to form a pellet suitable for thermal physical vapor deposition to produce an organic layer on a substrate for use in an organic light-emitting device (paragraphs [0081-0083]).

Therefore, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to modify the method of Shi for forming a solid homogenous mixture of organic powders for thermal physical vapor deposition with the method of Van Slyke for forming a pellet from a solid homogenous mixture of organic powders for thermal physical vapor deposition with a reasonable expectation of

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success. The motivation to do so is provided by Van Slyke who describes the various problems observed using powders for thermal physical vapor deposition to produce an organic layer on a substrate for use in an organic light-emitting device (paragraph [0009]) and the various benefits, such as ease of transportation and handling, associated with forming the mixture into a pellet form [paragraphs [0018-0019]. Thus, the claimed invention as a whole is rendered *prima facie* obvious over the combined teaching of the prior art.

As to claim 3, Shi teaches the use of an overlapping range of 0.5 to 50 mole percent of the dopant component in the mixture (paragraphs [0037] and [0062]). Further, Van Slyke et al. teach that any range of dopant material may be selected for forming the mixture (Figure 9, step 904).

As to claim 4, Shi teaches cooling the mixture to ambient temperature and solidifying the mixture (paragraph [0032]). Cooling the mixture to ambient temperature solidifies the melted mixture since at ambient temperature the components of the mixture are solids.

As to claim 5, Shi in view of Van Slyke et al. teach the method of claim 2 as discussed in the 103(a) rejection above, but do not teach compacting the mixture in a range of pressures between 3,000 – 20,000 pounds per square inch. However, Van Slyke et al. do teach that powders have problems in their utilization in thermal physical vapor deposition due to having a relatively low density (paragraph [0009, lines 22-27]) and the fact that the material is difficult to heat due to low particle-to particle contact area (paragraph [0009, lines 27-41]) and that these facts may have a negative impact

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on the ability to outgas the material due to an inability to uniformly heat the material (paragraphs [000, lines 27-57]).

Further, Van Slyke et al. teach that pressure is applied to agglomerate the powder into a pellet (paragraph [0033]). Depending on the weight fraction of each material component and the specific materials employed, the pressure required to agglomerate the powder into a pellet will vary.

Therefore, one having ordinary skill would have to take these variables into consideration when determining the pressure to apply to the powder mixture to form a pellet. As such, pressure is a result effective control variable for forming a solid pellet that would have been readily optimized as is routinely practiced in the art. (See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

As to claim 6, Shi in view of Van Slyke et al. teach the method of claim 1 as discussed in the 103(a) rejection above. Shi in view of Van Slyke et al. do not explicitly teach heating the powder mixture in a range of temperatures between 300 °C to 700 °C. However, Van Slyke et al. do teach heating the powder mixture to a temperature of about 300 °C (paragraph [0030]) when forming the pellet. Additionally, one having ordinary skill would be well aware that the temperature required to melt the mixture of material would depend on the weight fraction of each material component and the specific materials employed.

Therefore, one having ordinary skill would have to take these variables into consideration when determining the temperature required to heat the mixture. As such,

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the heating temperature to melt the mixture would have been readily optimized as is routinely practiced in the art.

As to claim 10, Van Slyke et al. does not explicitly state the precise reduced pressure at which outgassing is performed, however the level of toxic and flammable vapors remaining in the vapor space, the time required to outgas and melt the mixture, the cost of the equipment required to achieve and operate at the reduced pressure, are dependent on the operating pressure in the container.

Therefore one having ordinary skill in the art would have to take all of these variables into consideration when determining what reduced pressure to employ. As such, this is a recognized control variable for operating systems at reduced pressure and would have been readily optimized. (See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being obvious over Shi (European Patent Application 1 156 536; published November 21, 2001) in view of Van Slyke et al. (European Patent Application 1 274 136; published January 8, 2003) and further in view of Saegusa (U.S. Patent 5,840,267; issued November 24, 1998).

Regarding claims 7 and 8, Shi in view of Van Slyke et al. teach the method of claim 1 as discussed in the 103(a) rejection above. Shi in view of Van Slyke et al. are silent as to the container to be used. However, Saegusa teaches mixing powders that are to be heated in a metal/platinum container (col. 10, lines 39-41).

Therefore, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to take the method of Shi in view of Van Slyke et al. and to implement the metal/platinum container taught by Saegusa with a reasonable expectation of success because one having ordinary skill would be motivated to provide a container for melting the powders that would not melt during the heating process and that would be noble/non-reactive to the materials being mixed (col. 7, line 24). Further, it is noted that platinum and tungsten crucibles/containers are notoriously well-known in the art as evidenced by their ready commercial availability. Thus, the claimed invention as a whole was *prima facie* obvious over the combined teaching of the prior art.

Response to Arguments

Applicant's arguments filed April 17, 2006 have been fully considered and are partially persuasive. The Shi (U.S. Patent Application Publication 2004/0016907) and Van Slyke et al. (U.S. Patent 6,797,314) references cited are withdrawn under 35 USC 103(c).

The Okuyama et al. reference (U.S. Patent 6,835,618) is currently withdrawn in view of the new grounds of rejection above. The examiner notes that the Okuyama et al. reference does constitute analogous art because it deals with the similar problem solving area of forming a homogeneous mixture of powders. Further, one having ordinary skill would be motivated to use the teaching of Okuyama due to the uncomplicated teaching of forming a homogeneous mixture taught in the reference. The

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Okuyama et al. reference is currently withdrawn for the reason of clarifying the rejection of the claims since it is not needed to meet the claim limitations.

Applicant argues that there is no motivation to use Saegusa (U.S. Patent 5,840,267). The examiner disagrees. Shi in view of Van Slyke as taught above teach placing the powder mixture into a container and heating the materials in the container until the mixture is melted. One having ordinary skill would be clearly motivated to provide a container with a higher melting point than the mixture of organic host and dopant. Saegusa provides an example demonstrating a platinum container/vessel can effectively withstand temperatures up to 1000 °C while mixing powders. Further, as taught by Saegusa, one having ordinary skill would be motivated to provide a container that was noble/non-reactive with material and that would not contaminate the mixture. The Saegusa reference is used to provide evidence for these known facts.

Conclusion

All claims are rejected.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2003/0153109, Ghosh et al. teach forming an analogous pellet under a pressure of 3000 – 15,000 psig.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Friday 7:00 - 5:00.

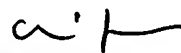
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JW

Jeff Wollschlager
Examiner
Art Unit 1732

May 24, 2006


CHRISTINA JOHNSON
PRIMARY EXAMINER
5/30/06